

A.L.P.O. SOLAR SECTION - Solar Ephemeris for 2010</head>

Glossary of Terms There are four parameters that are used to calculate the heliographic coordinates of a feature on the solar disk:

Four parameters used in the calculate the heliographic coordinates of a feature on the solar disk:-

Lo - the heliographic longitude of the centre of the disk - this decreases by an average value of 13.2° per day

Po - the position angle of the north end of the axis of rotation, measured +ve if east of the north point of the disk,

Bo - the heliographic latitude of the centre of the disk and the apparent diameter of the Sun

ALPO Solar Section 2010 Solar Ephemeris
Ephemeris Computed by Brad Timerson, A.L.P.O. Solar Section

CALENDAR DATE	JULIAN DATE	ROTATION NUMBER	HELIOGRAPHIC			DIAMETER	RA	DEC
			Lo	Bo	Po	(arcmin)	(HH:MM)	(deg)
12/30/2009	2455195.5	2091	59.24	-2.77	3.06	32.530	18:37.2	-23.17
12/31/2009	2455196.5	2091	46.06	-2.89	2.58	32.530	18:41.6	-23.11
1/ 1/2010	2455197.5	2091	32.89	-3.01	2.10	32.531	18:46.0	-23.03
1/ 2/2010	2455198.5	2091	19.71	-3.12	1.61	32.531	18:50.4	-22.95
1/ 3/2010	2455199.5	2091	6.54	-3.24	1.13	32.531	18:54.8	-22.85
1/ 4/2010	2455200.5	2092	353.37	-3.35	0.64	32.531	18:59.2	-22.75
1/ 5/2010	2455201.5	2092	340.19	-3.47	0.16	32.531	19: 3.6	-22.65
1/ 6/2010	2455202.5	2092	327.02	-3.58	-0.33	32.531	19: 8.0	-22.53
1/ 7/2010	2455203.5	2092	313.85	-3.69	-0.81	32.530	19:12.4	-22.41
1/ 8/2010	2455204.5	2092	300.67	-3.80	-1.29	32.529	19:16.7	-22.28
1/ 9/2010	2455205.5	2092	287.50	-3.91	-1.77	32.529	19:21.1	-22.15
1/10/2010	2455206.5	2092	274.33	-4.02	-2.25	32.528	19:25.4	-22.00
1/11/2010	2455207.5	2092	261.16	-4.12	-2.73	32.526	19:29.8	-21.85
1/12/2010	2455208.5	2092	247.98	-4.23	-3.20	32.525	19:34.1	-21.70
1/13/2010	2455209.5	2092	234.81	-4.33	-3.68	32.523	19:38.4	-21.53
1/14/2010	2455210.5	2092	221.64	-4.44	-4.15	32.522	19:42.8	-21.36
1/15/2010	2455211.5	2092	208.47	-4.54	-4.62	32.520	19:47.1	-21.18
1/16/2010	2455212.5	2092	195.30	-4.64	-5.09	32.518	19:51.4	-21.00
1/17/2010	2455213.5	2092	182.19	-4.74	-5.55	32.516	19:55.6	-20.81
1/18/2010	2455214.5	2092	169.02	-4.83	-6.01	32.513	19:59.9	-20.61
1/19/2010	2455215.5	2092	155.85	-4.93	-6.47	32.511	20: 4.2	-20.40
1/20/2010	2455216.5	2092	142.68	-5.02	-6.93	32.508	20: 8.4	-20.19
1/21/2010	2455217.5	2092	129.51	-5.11	-7.38	32.505	20:12.6	-19.97
1/22/2010	2455218.5	2092	116.34	-5.20	-7.83	32.502	20:16.9	-19.75
1/23/2010	2455219.5	2092	103.17	-5.29	-8.28	32.499	20:21.1	-19.52
1/24/2010	2455220.5	2092	90.00	-5.38	-8.72	32.495	20:25.3	-19.28
1/25/2010	2455221.5	2092	76.82	-5.46	-9.16	32.492	20:29.4	-19.04
1/26/2010	2455222.5	2092	63.66	-5.55	-9.60	32.488	20:33.6	-18.80

1/27/2010	2455223.5	2092	50.49	-5.63	-10.03	32.485	20:37.8	-18.54
1/28/2010	2455224.5	2092	37.32	-5.71	-10.46	32.481	20:41.9	-18.28
1/29/2010	2455225.5	2092	24.15	-5.79	-10.88	32.476	20:46.0	-18.02
1/30/2010	2455226.5	2092	10.98	-5.87	-11.30	32.472	20:50.1	-17.75
1/31/2010	2455227.5	2093	357.81	-5.94	-11.71	32.468	20:54.2	-17.47
2/ 1/2010	2455228.5	2093	344.64	-6.01	-12.12	32.463	20:58.3	-17.19
2/ 2/2010	2455229.5	2093	331.47	-6.08	-12.53	32.459	21: 2.4	-16.91
2/ 3/2010	2455230.5	2093	318.30	-6.15	-12.93	32.454	21: 6.5	-16.62
2/ 4/2010	2455231.5	2093	305.13	-6.22	-13.33	32.449	21:10.5	-16.32
2/ 5/2010	2455232.5	2093	291.96	-6.28	-13.72	32.444	21:14.5	-16.02
2/ 6/2010	2455233.5	2093	278.85	-6.35	-14.10	32.438	21:18.6	-15.72
2/ 7/2010	2455234.5	2093	265.68	-6.41	-14.49	32.433	21:22.6	-15.41
2/ 8/2010	2455235.5	2093	252.51	-6.47	-14.86	32.427	21:26.6	-15.10
2/ 9/2010	2455236.5	2093	239.34	-6.52	-15.23	32.422	21:30.5	-14.78
2/10/2010	2455237.5	2093	226.17	-6.58	-15.60	32.416	21:34.5	-14.46
2/11/2010	2455238.5	2093	213.00	-6.63	-15.96	32.410	21:38.5	-14.13
2/12/2010	2455239.5	2093	199.83	-6.68	-16.32	32.404	21:42.4	-13.80
2/13/2010	2455240.5	2093	186.66	-6.73	-16.67	32.398	21:46.3	-13.47
2/14/2010	2455241.5	2093	173.49	-6.78	-17.01	32.391	21:50.2	-13.13
2/15/2010	2455242.5	2093	160.31	-6.82	-17.35	32.385	21:54.1	-12.79
2/16/2010	2455243.5	2093	147.14	-6.86	-17.69	32.379	21:58.0	-12.45
2/17/2010	2455244.5	2093	133.97	-6.90	-18.01	32.372	22: 1.9	-12.10
2/18/2010	2455245.5	2093	120.80	-6.94	-18.34	32.365	22: 5.8	-11.75
2/19/2010	2455246.5	2093	107.63	-6.98	-18.65	32.358	22: 9.6	-11.40
2/20/2010	2455247.5	2093	94.46	-7.01	-18.96	32.351	22:13.5	-11.04
2/21/2010	2455248.5	2093	81.28	-7.04	-19.27	32.344	22:17.3	-10.68
2/22/2010	2455249.5	2093	68.11	-7.07	-19.57	32.337	22:21.2	-10.32
2/23/2010	2455250.5	2093	54.94	-7.10	-19.86	32.330	22:25.0	-9.95
2/24/2010	2455251.5	2093	41.76	-7.12	-20.15	32.322	22:28.8	-9.58
2/25/2010	2455252.5	2093	28.59	-7.15	-20.43	32.315	22:32.6	-9.22
2/26/2010	2455253.5	2093	15.48	-7.17	-20.70	32.307	22:36.3	-8.84
2/27/2010	2455254.5	2093	2.30	-7.19	-20.97	32.299	22:40.1	-8.47
2/28/2010	2455255.5	2094	349.13	-7.20	-21.23	32.292	22:43.9	-8.09
3/ 1/2010	2455256.5	2094	335.95	-7.21	-21.49	32.284	22:47.6	-7.71
3/ 2/2010	2455257.5	2094	322.78	-7.23	-21.74	32.276	22:51.4	-7.33
3/ 3/2010	2455258.5	2094	309.60	-7.24	-21.98	32.268	22:55.1	-6.95
3/ 4/2010	2455259.5	2094	296.42	-7.24	-22.22	32.260	22:58.9	-6.57
3/ 5/2010	2455260.5	2094	283.25	-7.25	-22.45	32.252	23: 2.6	-6.18
3/ 6/2010	2455261.5	2094	270.07	-7.25	-22.68	32.243	23: 6.3	-5.79
3/ 7/2010	2455262.5	2094	256.89	-7.25	-22.89	32.235	23:10.0	-5.41
3/ 8/2010	2455263.5	2094	243.71	-7.25	-23.11	32.227	23:13.7	-5.02
3/ 9/2010	2455264.5	2094	230.53	-7.24	-23.31	32.218	23:17.4	-4.63
3/10/2010	2455265.5	2094	217.36	-7.24	-23.51	32.210	23:21.1	-4.24
3/11/2010	2455266.5	2094	204.18	-7.23	-23.70	32.201	23:24.8	-3.84
3/12/2010	2455267.5	2094	190.99	-7.22	-23.89	32.192	23:28.5	-3.45
3/13/2010	2455268.5	2094	177.81	-7.20	-24.06	32.184	23:32.2	-3.06
3/14/2010	2455269.5	2094	164.63	-7.19	-24.24	32.175	23:35.8	-2.66
3/15/2010	2455270.5	2094	151.45	-7.17	-24.40	32.166	23:39.5	-2.27
3/16/2010	2455271.5	2094	138.27	-7.15	-24.56	32.157	23:43.2	-1.87
3/17/2010	2455272.5	2094	125.08	-7.13	-24.71	32.148	23:46.8	-1.48

3/18/2010	2455273.5	2094	111.96	-7.11	-24.86	32.139	23:50.5	-1.08
3/19/2010	2455274.5	2094	98.78	-7.08	-24.99	32.130	23:54.1	-0.69
3/20/2010	2455275.5	2094	85.59	-7.05	-25.12	32.121	23:57.8	-0.29
3/21/2010	2455276.5	2094	72.40	-7.02	-25.25	32.112	00: 1.4	0.11
3/22/2010	2455277.5	2094	59.22	-6.99	-25.37	32.103	00: 5.1	0.50
3/23/2010	2455278.5	2094	46.03	-6.96	-25.48	32.094	00: 8.7	0.90
3/24/2010	2455279.5	2094	32.84	-6.92	-25.58	32.085	00:12.4	1.29
3/25/2010	2455280.5	2094	19.65	-6.88	-25.68	32.076	00:16.0	1.68
3/26/2010	2455281.5	2094	6.46	-6.84	-25.76	32.067	00:19.6	2.08
3/27/2010	2455282.5	2095	353.27	-6.80	-25.85	32.058	00:23.3	2.47
3/28/2010	2455283.5	2095	340.08	-6.75	-25.92	32.048	00:26.9	2.86
3/29/2010	2455284.5	2095	326.89	-6.71	-25.99	32.039	00:30.6	3.25
3/30/2010	2455285.5	2095	313.69	-6.66	-26.05	32.030	00:34.2	3.64
3/31/2010	2455286.5	2095	300.50	-6.61	-26.10	32.021	00:37.9	4.03
4/ 1/2010	2455287.5	2095	287.31	-6.55	-26.15	32.012	00:41.5	4.42
4/ 2/2010	2455288.5	2095	274.11	-6.50	-26.19	32.002	00:45.1	4.80
4/ 3/2010	2455289.5	2095	260.91	-6.44	-26.22	31.993	00:48.8	5.19
4/ 4/2010	2455290.5	2095	247.72	-6.38	-26.25	31.984	00:52.4	5.57
4/ 5/2010	2455291.5	2095	234.52	-6.32	-26.27	31.975	00:56.1	5.95
4/ 6/2010	2455292.5	2095	221.32	-6.26	-26.28	31.966	00:59.8	6.33
4/ 7/2010	2455293.5	2095	208.18	-6.20	-26.28	31.956	01: 3.4	6.71
4/ 8/2010	2455294.5	2095	194.98	-6.13	-26.28	31.947	01: 7.1	7.09
4/ 9/2010	2455295.5	2095	181.78	-6.07	-26.27	31.938	01:10.7	7.46
4/10/2010	2455296.5	2095	168.58	-6.00	-26.25	31.929	01:14.4	7.83
4/11/2010	2455297.5	2095	155.38	-5.93	-26.22	31.920	01:18.1	8.20
4/12/2010	2455298.5	2095	142.18	-5.85	-26.19	31.911	01:21.8	8.57
4/13/2010	2455299.5	2095	128.97	-5.78	-26.15	31.902	01:25.5	8.93
4/14/2010	2455300.5	2095	115.77	-5.70	-26.10	31.893	01:29.2	9.30
4/15/2010	2455301.5	2095	102.56	-5.63	-26.04	31.884	01:32.9	9.65
4/16/2010	2455302.5	2095	89.35	-5.55	-25.98	31.875	01:36.6	10.01
4/17/2010	2455303.5	2095	76.15	-5.47	-25.91	31.866	01:40.3	10.37
4/18/2010	2455304.5	2095	62.94	-5.38	-25.83	31.857	01:44.0	10.72
4/19/2010	2455305.5	2095	49.73	-5.30	-25.75	31.848	01:47.7	11.07
4/20/2010	2455306.5	2095	36.52	-5.22	-25.66	31.840	01:51.4	11.41
4/21/2010	2455307.5	2095	23.31	-5.13	-25.56	31.831	01:55.2	11.75
4/22/2010	2455308.5	2095	10.10	-5.04	-25.45	31.822	01:58.9	12.09
4/23/2010	2455309.5	2096	356.89	-4.95	-25.34	31.814	02: 2.7	12.43
4/24/2010	2455310.5	2096	343.67	-4.86	-25.22	31.805	02: 6.4	12.76
4/25/2010	2455311.5	2096	330.46	-4.77	-25.09	31.797	02:10.2	13.09
4/26/2010	2455312.5	2096	317.24	-4.68	-24.95	31.788	02:14.0	13.42
4/27/2010	2455313.5	2096	304.09	-4.58	-24.81	31.780	02:17.7	13.74
4/28/2010	2455314.5	2096	290.88	-4.48	-24.66	31.772	02:21.5	14.06
4/29/2010	2455315.5	2096	277.66	-4.39	-24.50	31.764	02:25.3	14.37
4/30/2010	2455316.5	2096	264.44	-4.29	-24.33	31.755	02:29.1	14.68
5/ 1/2010	2455317.5	2096	251.22	-4.19	-24.16	31.747	02:32.9	14.99
5/ 2/2010	2455318.5	2096	238.00	-4.09	-23.98	31.739	02:36.8	15.29
5/ 3/2010	2455319.5	2096	224.78	-3.99	-23.79	31.732	02:40.6	15.59
5/ 4/2010	2455320.5	2096	211.56	-3.88	-23.60	31.724	02:44.4	15.88
5/ 5/2010	2455321.5	2096	198.34	-3.78	-23.40	31.716	02:48.3	16.17
5/ 6/2010	2455322.5	2096	185.12	-3.67	-23.19	31.708	02:52.2	16.45

5/ 7/2010	2455323.5	2096	171.89	-3.57	-22.97	31.701	02:56.0	16.73
5/ 8/2010	2455324.5	2096	158.67	-3.46	-22.75	31.693	02:59.9	17.01
5/ 9/2010	2455325.5	2096	145.45	-3.35	-22.52	31.686	03: 3.8	17.28
5/10/2010	2455326.5	2096	132.22	-3.24	-22.29	31.679	03: 7.7	17.54
5/11/2010	2455327.5	2096	119.00	-3.14	-22.04	31.671	03:11.6	17.80
5/12/2010	2455328.5	2096	105.77	-3.02	-21.79	31.664	03:15.5	18.06
5/13/2010	2455329.5	2096	92.54	-2.91	-21.54	31.657	03:19.4	18.31
5/14/2010	2455330.5	2096	79.31	-2.80	-21.27	31.650	03:23.4	18.56
5/15/2010	2455331.5	2096	66.09	-2.69	-21.00	31.644	03:27.3	18.80
5/16/2010	2455332.5	2096	52.86	-2.58	-20.73	31.637	03:31.3	19.03
5/17/2010	2455333.5	2096	39.63	-2.46	-20.44	31.630	03:35.2	19.26
5/18/2010	2455334.5	2096	26.46	-2.35	-20.16	31.624	03:39.2	19.49
5/19/2010	2455335.5	2096	13.23	-2.23	-19.86	31.617	03:43.2	19.70
5/20/2010	2455336.5	2097	360.00	-2.12	-19.56	31.611	03:47.2	19.92
5/21/2010	2455337.5	2097	346.77	-2.00	-19.25	31.605	03:51.2	20.12
5/22/2010	2455338.5	2097	333.53	-1.88	-18.94	31.599	03:55.2	20.33
5/23/2010	2455339.5	2097	320.30	-1.76	-18.62	31.593	03:59.2	20.52
5/24/2010	2455340.5	2097	307.07	-1.65	-18.29	31.587	04: 3.2	20.71
5/25/2010	2455341.5	2097	293.83	-1.53	-17.96	31.581	04: 7.3	20.90
5/26/2010	2455342.5	2097	280.60	-1.41	-17.62	31.576	04:11.3	21.07
5/27/2010	2455343.5	2097	267.37	-1.29	-17.28	31.570	04:15.4	21.25
5/28/2010	2455344.5	2097	254.13	-1.17	-16.93	31.565	04:19.4	21.41
5/29/2010	2455345.5	2097	240.90	-1.05	-16.57	31.560	04:23.5	21.57
5/30/2010	2455346.5	2097	227.66	-0.93	-16.22	31.555	04:27.6	21.73
5/31/2010	2455347.5	2097	214.42	-0.81	-15.85	31.550	04:31.6	21.87
6/ 1/2010	2455348.5	2097	201.19	-0.69	-15.48	31.545	04:35.7	22.01
6/ 2/2010	2455349.5	2097	187.95	-0.57	-15.11	31.540	04:39.8	22.15
6/ 3/2010	2455350.5	2097	174.71	-0.45	-14.73	31.535	04:43.9	22.28
6/ 4/2010	2455351.5	2097	161.47	-0.33	-14.34	31.531	04:48.0	22.40
6/ 5/2010	2455352.5	2097	148.24	-0.21	-13.96	31.527	04:52.1	22.51
6/ 6/2010	2455353.5	2097	135.00	-0.09	-13.56	31.523	04:56.3	22.62
6/ 7/2010	2455354.5	2097	121.82	0.03	-13.17	31.518	04:60.4	22.72
6/ 8/2010	2455355.5	2097	108.58	0.15	-12.77	31.515	05: 4.5	22.82
6/ 9/2010	2455356.5	2097	95.34	0.27	-12.36	31.511	05: 8.6	22.91
6/10/2010	2455357.5	2097	82.10	0.39	-11.95	31.507	05:12.8	22.99
6/11/2010	2455358.5	2097	68.86	0.51	-11.54	31.504	05:16.9	23.06
6/12/2010	2455359.5	2097	55.62	0.64	-11.12	31.500	05:21.1	23.13
6/13/2010	2455360.5	2097	42.38	0.76	-10.70	31.497	05:25.2	23.19
6/14/2010	2455361.5	2097	29.14	0.87	-10.28	31.494	05:29.4	23.25
6/15/2010	2455362.5	2097	15.90	0.99	-9.86	31.491	05:33.5	23.30
6/16/2010	2455363.5	2097	2.66	1.11	-9.43	31.488	05:37.7	23.34
6/17/2010	2455364.5	2098	349.42	1.23	-9.00	31.485	05:41.8	23.37
6/18/2010	2455365.5	2098	336.18	1.35	-8.56	31.483	05:46.0	23.40
6/19/2010	2455366.5	2098	322.94	1.47	-8.13	31.480	05:50.1	23.42
6/20/2010	2455367.5	2098	309.70	1.59	-7.69	31.478	05:54.3	23.43
6/21/2010	2455368.5	2098	296.46	1.70	-7.25	31.476	05:58.5	23.44
6/22/2010	2455369.5	2098	283.22	1.82	-6.80	31.474	06: 2.6	23.44
6/23/2010	2455370.5	2098	269.98	1.94	-6.36	31.472	06: 6.8	23.43
6/24/2010	2455371.5	2098	256.74	2.05	-5.91	31.471	06:10.9	23.42
6/25/2010	2455372.5	2098	243.50	2.17	-5.47	31.469	06:15.1	23.40

6/26/2010	2455373.5	2098	230.26	2.28	-5.02	31.468	06:19.2	23.37
6/27/2010	2455374.5	2098	217.08	2.40	-4.57	31.466	06:23.4	23.34
6/28/2010	2455375.5	2098	203.84	2.51	-4.12	31.465	06:27.5	23.30
6/29/2010	2455376.5	2098	190.60	2.62	-3.67	31.464	06:31.7	23.25
6/30/2010	2455377.5	2098	177.36	2.73	-3.21	31.464	06:35.8	23.19
7/ 1/2010	2455378.5	2098	164.12	2.84	-2.76	31.463	06:39.9	23.13
7/ 2/2010	2455379.5	2098	150.88	2.96	-2.31	31.462	06:44.1	23.06
7/ 3/2010	2455380.5	2098	137.64	3.06	-1.85	31.462	06:48.2	22.99
7/ 4/2010	2455381.5	2098	124.40	3.17	-1.40	31.462	06:52.3	22.91
7/ 5/2010	2455382.5	2098	111.16	3.28	-0.95	31.462	06:56.4	22.82
7/ 6/2010	2455383.5	2098	97.92	3.39	-0.49	31.462	07:0 .6	22.72
7/ 7/2010	2455384.5	2098	84.68	3.49	-0.04	31.462	07: 4.7	22.62
7/ 8/2010	2455385.5	2098	71.44	3.60	0.41	31.463	07: 8.8	22.51
7/ 9/2010	2455386.5	2098	58.20	3.70	0.86	31.463	07:12.9	22.40
7/10/2010	2455387.5	2098	44.97	3.81	1.31	31.464	07:16.9	22.28
7/11/2010	2455388.5	2098	31.73	3.91	1.76	31.465	07:21.0	22.15
7/12/2010	2455389.5	2098	18.49	4.01	2.21	31.466	07:25.1	22.02
7/13/2010	2455390.5	2098	5.25	4.11	2.66	31.467	07:29.2	21.88
7/14/2010	2455391.5	2099	352.02	4.21	3.10	31.468	07:33.2	21.73
7/15/2010	2455392.5	2099	338.78	4.30	3.55	31.469	07:37.3	21.58
7/16/2010	2455393.5	2099	325.54	4.40	3.99	31.471	07:41.3	21.42
7/17/2010	2455394.5	2099	312.37	4.50	4.43	31.473	07:45.3	21.25
7/18/2010	2455395.5	2099	299.13	4.59	4.87	31.475	07:49.4	21.08
7/19/2010	2455396.5	2099	285.90	4.68	5.31	31.477	07:53.4	20.91
7/20/2010	2455397.5	2099	272.66	4.77	5.74	31.479	07:57.4	20.73
7/21/2010	2455398.5	2099	259.43	4.86	6.17	31.481	08: 1.4	20.54
7/22/2010	2455399.5	2099	246.19	4.95	6.60	31.483	08: 5.4	20.34
7/23/2010	2455400.5	2099	232.96	5.04	7.03	31.486	08: 9.4	20.14
7/24/2010	2455401.5	2099	219.73	5.13	7.45	31.489	08:13.3	19.94
7/25/2010	2455402.5	2099	206.49	5.21	7.88	31.492	08:17.3	19.73
7/26/2010	2455403.5	2099	193.26	5.29	8.30	31.495	08:21.2	19.51
7/27/2010	2455404.5	2099	180.03	5.38	8.71	31.498	08:25.2	19.29
7/28/2010	2455405.5	2099	166.80	5.46	9.12	31.501	08:29.1	19.06
7/29/2010	2455406.5	2099	153.57	5.54	9.53	31.504	08:33.0	18.83
7/30/2010	2455407.5	2099	140.34	5.61	9.94	31.508	08:36.9	18.59
7/31/2010	2455408.5	2099	127.11	5.69	10.34	31.512	08:40.8	18.35
8/ 1/2010	2455409.5	2099	113.88	5.76	10.74	31.515	08:44.7	18.10
8/ 2/2010	2455410.5	2099	100.65	5.84	11.14	31.519	08:48.6	17.85
8/ 3/2010	2455411.5	2099	87.42	5.91	11.53	31.524	08:52.5	17.59
8/ 4/2010	2455412.5	2099	74.19	5.98	11.92	31.528	08:56.3	17.33
8/ 5/2010	2455413.5	2099	60.96	6.04	12.31	31.532	08:60.2	17.07
8/ 6/2010	2455414.5	2099	47.80	6.11	12.69	31.537	09: 4.0	16.79
8/ 7/2010	2455415.5	2099	34.57	6.17	13.06	31.541	09: 7.8	16.52
8/ 8/2010	2455416.5	2099	21.35	6.24	13.44	31.546	09:11.7	16.24
8/ 9/2010	2455417.5	2099	8.12	6.30	13.81	31.551	09:15.5	15.95
8/10/2010	2455418.5	2100	354.90	6.36	14.17	31.556	09:19.3	15.66
8/11/2010	2455419.5	2100	341.67	6.42	14.53	31.561	09:23.1	15.37
8/12/2010	2455420.5	2100	328.45	6.47	14.89	31.566	09:26.8	15.07
8/13/2010	2455421.5	2100	315.23	6.53	15.24	31.572	09:30.6	14.77
8/14/2010	2455422.5	2100	302.00	6.58	15.59	31.577	09:34.4	14.47

8/15/2010	2455423.5	2100	288.78	6.63	15.93	31.583	09:38.1	14.16
8/16/2010	2455424.5	2100	275.56	6.68	16.27	31.588	09:41.9	13.85
8/17/2010	2455425.5	2100	262.34	6.72	16.60	31.594	09:45.6	13.53
8/18/2010	2455426.5	2100	249.12	6.77	16.93	31.600	09:49.3	13.21
8/19/2010	2455427.5	2100	235.90	6.81	17.26	31.606	09:53.1	12.89
8/20/2010	2455428.5	2100	222.68	6.85	17.58	31.613	09:56.8	12.56
8/21/2010	2455429.5	2100	209.46	6.89	17.89	31.619	10:0.5	12.23
8/22/2010	2455430.5	2100	196.24	6.93	18.20	31.625	10:4.2	11.90
8/23/2010	2455431.5	2100	183.03	6.96	18.51	31.632	10:7.9	11.56
8/24/2010	2455432.5	2100	169.81	7.00	18.81	31.638	10:11.5	11.22
8/25/2010	2455433.5	2100	156.59	7.03	19.10	31.645	10:15.2	10.88
8/26/2010	2455434.5	2100	143.44	7.06	19.39	31.652	10:18.9	10.53
8/27/2010	2455435.5	2100	130.22	7.08	19.67	31.659	10:22.5	10.18
8/28/2010	2455436.5	2100	117.01	7.11	19.95	31.666	10:26.2	9.83
8/29/2010	2455437.5	2100	103.79	7.13	20.23	31.673	10:29.8	9.48
8/30/2010	2455438.5	2100	90.58	7.15	20.50	31.680	10:33.5	9.12
8/31/2010	2455439.5	2100	77.37	7.17	20.76	31.688	10:37.1	8.77
9/ 1/2010	2455440.5	2100	64.16	7.19	21.02	31.695	10:40.8	8.40
9/ 2/2010	2455441.5	2100	50.94	7.20	21.27	31.703	10:44.4	8.04
9/ 3/2010	2455442.5	2100	37.73	7.22	21.51	31.710	10:48.0	7.68
9/ 4/2010	2455443.5	2100	24.52	7.23	21.75	31.718	10:51.6	7.31
9/ 5/2010	2455444.5	2100	11.31	7.24	21.99	31.726	10:55.2	6.94
9/ 6/2010	2455445.5	2101	358.10	7.24	22.22	31.733	10:58.9	6.57
9/ 7/2010	2455446.5	2101	344.89	7.25	22.44	31.741	11:2.5	6.20
9/ 8/2010	2455447.5	2101	331.68	7.25	22.66	31.749	11:6.1	5.82
9/ 9/2010	2455448.5	2101	318.48	7.25	22.87	31.757	11:9.7	5.44
9/10/2010	2455449.5	2101	305.27	7.25	23.08	31.766	11:13.3	5.07
9/11/2010	2455450.5	2101	292.06	7.24	23.28	31.774	11:16.9	4.69
9/12/2010	2455451.5	2101	278.85	7.24	23.47	31.782	11:20.4	4.31
9/13/2010	2455452.5	2101	265.65	7.23	23.66	31.790	11:24.0	3.92
9/14/2010	2455453.5	2101	252.44	7.22	23.84	31.799	11:27.6	3.54
9/15/2010	2455454.5	2101	239.24	7.21	24.02	31.807	11:31.2	3.16
9/16/2010	2455455.5	2101	226.10	7.19	24.19	31.816	11:34.8	2.77
9/17/2010	2455456.5	2101	212.89	7.18	24.35	31.825	11:38.4	2.39
9/18/2010	2455457.5	2101	199.69	7.16	24.51	31.833	11:42.0	2.00
9/19/2010	2455458.5	2101	186.48	7.14	24.66	31.842	11:45.6	1.61
9/20/2010	2455459.5	2101	173.28	7.12	24.80	31.851	11:49.2	1.22
9/21/2010	2455460.5	2101	160.08	7.09	24.94	31.859	11:52.7	0.83
9/22/2010	2455461.5	2101	146.88	7.06	25.07	31.868	11:56.3	0.45
9/23/2010	2455462.5	2101	133.68	7.04	25.20	31.877	11:59.9	0.06
9/24/2010	2455463.5	2101	120.47	7.00	25.32	31.886	12:3.5	-0.33
9/25/2010	2455464.5	2101	107.27	6.97	25.43	31.895	12:7.1	-0.72
9/26/2010	2455465.5	2101	94.07	6.94	25.53	31.904	12:10.7	-1.11
9/27/2010	2455466.5	2101	80.87	6.90	25.63	31.913	12:14.3	-1.50
9/28/2010	2455467.5	2101	67.67	6.86	25.72	31.922	12:17.9	-1.89
9/29/2010	2455468.5	2101	54.48	6.82	25.81	31.931	12:21.5	-2.28
9/30/2010	2455469.5	2101	41.28	6.77	25.89	31.940	12:25.2	-2.67
10/ 1/2010	2455470.5	2101	28.08	6.73	25.96	31.949	12:28.8	-3.06
10/ 2/2010	2455471.5	2101	14.88	6.68	26.02	31.959	12:32.4	-3.45
10/ 3/2010	2455472.5	2101	1.68	6.63	26.08	31.968	12:36.0	-3.84

10/ 4/2010	2455473.5	2102	348.49	6.58	26.13	31.977	12:39.7	-4.22
10/ 5/2010	2455474.5	2102	335.29	6.53	26.17	31.986	12:43.3	-4.61
10/ 6/2010	2455475.5	2102	322.16	6.47	26.21	31.995	12:46.9	-4.99
10/ 7/2010	2455476.5	2102	308.96	6.41	26.24	32.005	12:50.6	-5.38
10/ 8/2010	2455477.5	2102	295.76	6.36	26.26	32.014	12:54.3	-5.76
10/ 9/2010	2455478.5	2102	282.57	6.29	26.27	32.023	12:57.9	-6.14
10/10/2010	2455479.5	2102	269.37	6.23	26.28	32.032	13: 1.6	-6.52
10/11/2010	2455480.5	2102	256.18	6.17	26.28	32.041	13: 5.3	-6.90
10/12/2010	2455481.5	2102	242.99	6.10	26.27	32.051	13: 9.0	-7.28
10/13/2010	2455482.5	2102	229.79	6.03	26.26	32.060	13:12.7	-7.65
10/14/2010	2455483.5	2102	216.60	5.96	26.23	32.069	13:16.4	-8.03
10/15/2010	2455484.5	2102	203.40	5.89	26.20	32.078	13:20.1	-8.40
10/16/2010	2455485.5	2102	190.21	5.81	26.17	32.087	13:23.8	-8.77
10/17/2010	2455486.5	2102	177.02	5.74	26.12	32.096	13:27.5	-9.14
10/18/2010	2455487.5	2102	163.83	5.66	26.07	32.106	13:31.3	-9.50
10/19/2010	2455488.5	2102	150.63	5.58	26.01	32.115	13:35.0	-9.87
10/20/2010	2455489.5	2102	137.44	5.50	25.94	32.124	13:38.8	-10.23
10/21/2010	2455490.5	2102	124.25	5.42	25.86	32.133	13:42.6	-10.59
10/22/2010	2455491.5	2102	111.06	5.33	25.78	32.142	13:46.4	-10.94
10/23/2010	2455492.5	2102	97.87	5.25	25.69	32.151	13:50.2	-11.29
10/24/2010	2455493.5	2102	84.68	5.16	25.59	32.159	13:54.0	-11.64
10/25/2010	2455494.5	2102	71.49	5.07	25.48	32.168	13:57.8	-11.99
10/26/2010	2455495.5	2102	58.36	4.98	25.37	32.177	14: 1.6	-12.34
10/27/2010	2455496.5	2102	45.17	4.88	25.25	32.186	14: 5.5	-12.68
10/28/2010	2455497.5	2102	31.98	4.79	25.12	32.194	14: 9.3	-13.02
10/29/2010	2455498.5	2102	18.79	4.70	24.98	32.203	14:13.2	-13.35
10/30/2010	2455499.5	2102	5.60	4.60	24.83	32.212	14:17.1	-13.68
10/31/2010	2455500.5	2103	352.41	4.50	24.68	32.220	14:20.9	-14.01
11/ 1/2010	2455501.5	2103	339.22	4.40	24.52	32.229	14:24.9	-14.33
11/ 2/2010	2455502.5	2103	326.03	4.30	24.35	32.237	14:28.8	-14.65
11/ 3/2010	2455503.5	2103	312.84	4.20	24.17	32.245	14:32.7	-14.97
11/ 4/2010	2455504.5	2103	299.66	4.09	23.99	32.254	14:36.7	-15.28
11/ 5/2010	2455505.5	2103	286.47	3.99	23.79	32.262	14:40.6	-15.59
11/ 6/2010	2455506.5	2103	273.28	3.88	23.59	32.270	14:44.6	-15.89
11/ 7/2010	2455507.5	2103	260.09	3.77	23.38	32.278	14:48.6	-16.19
11/ 8/2010	2455508.5	2103	246.90	3.66	23.17	32.286	14:52.6	-16.48
11/ 9/2010	2455509.5	2103	233.72	3.55	22.94	32.294	14:56.6	-16.77
11/10/2010	2455510.5	2103	220.53	3.44	22.71	32.301	15:0 .6	-17.06
11/11/2010	2455511.5	2103	207.34	3.33	22.47	32.309	15: 4.7	-17.34
11/12/2010	2455512.5	2103	194.16	3.22	22.22	32.317	15: 8.7	-17.61
11/13/2010	2455513.5	2103	180.97	3.10	21.97	32.324	15:12.8	-17.88
11/14/2010	2455514.5	2103	167.78	2.99	21.71	32.331	15:16.9	-18.15
11/15/2010	2455515.5	2103	154.66	2.87	21.43	32.339	15:21.0	-18.41
11/16/2010	2455516.5	2103	141.48	2.75	21.16	32.346	15:25.1	-18.66
11/17/2010	2455517.5	2103	128.29	2.64	20.87	32.353	15:29.2	-18.91
11/18/2010	2455518.5	2103	115.10	2.52	20.58	32.360	15:33.4	-19.15
11/19/2010	2455519.5	2103	101.92	2.40	20.28	32.367	15:37.5	-19.39
11/20/2010	2455520.5	2103	88.74	2.28	19.97	32.374	15:41.7	-19.62
11/21/2010	2455521.5	2103	75.55	2.15	19.66	32.380	15:45.9	-19.85
11/22/2010	2455522.5	2103	62.37	2.03	19.34	32.387	15:50.1	-20.07

11/23/2010	2455523.5	2103	49.18	1.91	19.01	32.393	15:54.3	-20.28
11/24/2010	2455524.5	2103	36.00	1.79	18.67	32.399	15:58.5	-20.49
11/25/2010	2455525.5	2103	22.82	1.66	18.33	32.405	16: 2.7	-20.69
11/26/2010	2455526.5	2103	9.63	1.54	17.98	32.411	16: 7.0	-20.88
11/27/2010	2455527.5	2104	356.45	1.41	17.63	32.417	16:11.2	-21.07
11/28/2010	2455528.5	2104	343.27	1.29	17.27	32.423	16:15.5	-21.25
11/29/2010	2455529.5	2104	330.08	1.16	16.90	32.429	16:19.8	-21.43
11/30/2010	2455530.5	2104	316.90	1.03	16.52	32.434	16:24.1	-21.60
12/ 1/2010	2455531.5	2104	303.72	0.91	16.14	32.440	16:28.4	-21.76
12/ 2/2010	2455532.5	2104	290.54	0.78	15.76	32.445	16:32.7	-21.91
12/ 3/2010	2455533.5	2104	277.35	0.65	15.36	32.450	16:37.0	-22.06
12/ 4/2010	2455534.5	2104	264.17	0.53	14.97	32.455	16:41.4	-22.20
12/ 5/2010	2455535.5	2104	251.05	0.40	14.56	32.460	16:45.7	-22.33
12/ 6/2010	2455536.5	2104	237.87	0.27	14.15	32.464	16:50.1	-22.46
12/ 7/2010	2455537.5	2104	224.69	0.14	13.74	32.469	16:54.4	-22.57
12/ 8/2010	2455538.5	2104	211.51	0.01	13.32	32.473	16:58.8	-22.69
12/ 9/2010	2455539.5	2104	198.33	-0.11	12.90	32.477	17: 3.2	-22.79
12/10/2010	2455540.5	2104	185.15	-0.24	12.47	32.482	17: 7.6	-22.89
12/11/2010	2455541.5	2104	171.97	-0.37	12.03	32.485	17:12.0	-22.97
12/12/2010	2455542.5	2104	158.79	-0.50	11.59	32.489	17:16.4	-23.06
12/13/2010	2455543.5	2104	145.61	-0.63	11.15	32.493	17:20.8	-23.13
12/14/2010	2455544.5	2104	132.43	-0.75	10.71	32.496	17:25.2	-23.19
12/15/2010	2455545.5	2104	119.25	-0.88	10.26	32.500	17:29.6	-23.25
12/16/2010	2455546.5	2104	106.08	-1.01	9.80	32.503	17:34.0	-23.30
12/17/2010	2455547.5	2104	92.90	-1.14	9.35	32.506	17:38.5	-23.35
12/18/2010	2455548.5	2104	79.72	-1.26	8.89	32.509	17:42.9	-23.38
12/19/2010	2455549.5	2104	66.54	-1.39	8.42	32.511	17:47.3	-23.41
12/20/2010	2455550.5	2104	53.36	-1.51	7.96	32.514	17:51.7	-23.43
12/21/2010	2455551.5	2104	40.19	-1.64	7.49	32.516	17:56.2	-23.44
12/22/2010	2455552.5	2104	27.01	-1.76	7.02	32.518	18:0 .6	-23.44
12/23/2010	2455553.5	2104	13.83	-1.89	6.54	32.520	18: 5.1	-23.44
12/24/2010	2455554.5	2104	0.66	-2.01	6.07	32.522	18: 9.5	-23.43
12/25/2010	2455555.5	2105	347.54	-2.14	5.59	32.524	18:13.9	-23.41
12/26/2010	2455556.5	2105	334.37	-2.26	5.11	32.525	18:18.4	-23.38
12/27/2010	2455557.5	2105	321.19	-2.38	4.63	32.527	18:22.8	-23.34
12/28/2010	2455558.5	2105	308.02	-2.50	4.15	32.528	18:27.2	-23.30
12/29/2010	2455559.5	2105	294.84	-2.62	3.67	32.529	18:31.7	-23.25
12/30/2010	2455560.5	2105	281.67	-2.74	3.18	32.530	18:36.1	-23.19
12/31/2010	2455561.5	2105	268.49	-2.86	2.70	32.530	18:40.5	-23.12
1/ 1/2011	2455562.5	2105	255.32	-2.98	2.21	32.531	18:44.9	-23.05
1/ 2/2011	2455563.5	2105	242.14	-3.09	1.73	32.531	18:49.3	-22.97
1/ 3/2011	2455564.5	2105	228.97	-3.21	1.24	32.531	18:53.7	-22.88